

*Fast-spin echo***WEST**

Generate Collection

Search Results - Record(s) 1 through 3 of 3 returned.☐ 1. Document ID: US 5825185 A Relevance Rank: 72

L2: Entry 2 of 3

File: USPT

Oct 20, 1998

US-PAT-NO: 5825185

DOCUMENT-IDENTIFIER: US 5825185 A

TITLE: Method for magnetic resonance spin echo scan calibration and reconstruction

DATE-ISSUED: October 20, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Liu; Haiying	Minneapolis	MN		
Bearden; Francis H.	Twinsburg	OH		
DeMeester; Gordon D.	Wickliffe	OH		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Picker International, Inc.	Highland Heights	OH				02

APPL-NO: 8/ 757153

DATE FILED: November 27, 1996

INT-CL: [6] G01V 3/00

US-CL-ISSUED: 324/309; 324/307

US-CL-CURRENT: 324/309; 324/307

FIELD-OF-SEARCH: 324/309, 324/307, 324/306, 324/314, 324/300, 324/312

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4851779</u>	July 1989	DeMeester et al.	324/309
<u>5138259</u>	August 1992	Schmitt et al.	324/309
<u>5581184</u>	December 1996	Heid	324/309
<u>5621321</u>	April 1997	Liu et al.	324/307
<u>5742163</u>	April 1998	Liu et al.	324/309

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0296834A3	December 1988	EPX	
0296834A2	December 1988	EPX	
0490528A1	June 1992	EPX	
0772057A1	July 1997	EPX	
4005675A1	August 1991	DEX	
4445782C1	July 1996	DEX	

OTHER PUBLICATIONS

Hennig, J., et al. "RARE Imaging: A Fast Imaging Method for Clinical MR," Mag. Res. Med., 3, pp. 823-833 (1986).
 Mulkern, R.V., et al., "Contrast Manipulation and Artifact Assessment of 2D and 3D Rare Sequences," Mag. Res. Imaging, 8, pp. 557-566 (1990).
 Zhou, et al., "On Phase Artifacts of High-Field Fast Spin-Echo Images," SMRI Abstract Book, p. 1248 (Aug. 1993).
 Zhou, et al., "Reduction of Ringing and Blurring Artifacts in Fast Spin-Echo Images," SMRI Abstract Book, p. 935 (Aug. 1993).
 Zhou, et al., "Reduction of Ringing and Blurring Artifacts in Fast Spin-Echo Images," J. Mag. Res. Imaging, 3, pp. 803-807 (Sep./Oct. 1993).
 Wan, et al., "Reduction of Phase Error Ghosting Artifacts in Thin Slice Fast Spin-Echo Imaging," Mag. Res. Med., 34, pp. 632-638 (1995).
 Press, et al. "Numerical Recipes in Fortran: The Art of Scientific Computing," 2nd. ed. (1992).
 XP002057350 2D Phase Correction For Multiple Shot EPI, Haiying Liu, et al. Proceedings International Society Magnetic Resonance Medicine, vol. 3.
 XP002057349 Cross-Correlation in MRI: Image Reg., P.V. Connaughton, et al. Book of Abstracts vol. 2, Society Magnetic Resonance Medicine and Biology.

ART-UNIT: 287

PRIMARY-EXAMINER: Arana; Louis M.

ATTY-AGENT-FIRM: Fay, Sharpe, Beall, Fagan, Minnich & McKee

ABSTRACT:

A transmitter (24) and gradient amplifiers (20) transmit radio frequency excitation and other pulses to induce magnetic resonance in selected magnetic dipoles and cause the magnetic resonance to be focused into a series of echoes (66) at each of a plurality of preselected echo positions following each excitation. A receiver (38) converts each echo into a data line. Calibration data lines having a close to zero phase-encoding are collected and used to generate correction parameters (102) for each of the echo positions. These parameters include relative echo center positions (96) and unitary complex correction vectors (106). The calibration data lines for each of the preselected positions are one-dimensionally Fourier transformed (82) and multiplied (90) by the same complex conjugate reference echo (80). These data lines are then inverse Fourier transformed (92) to generate an auxiliary data array (94). A relative echo center position is computed (96) which represents a fractional shift of the true center relative to the reference echo. A complex sum is computed (104) from the relative echo center position and normalized (106) to generate a unitary correction vector. The phase-correction parameters are used to phase-correct (116) imaging data lines. The phase-corrected imaging data lines are sorted (122) to build an image plane which is one-dimensionally Fourier transformed (128) in the phase-encoding direction to produce a final corrected image (130) for display on a monitor (134).

18 Claims, 7 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	FIGS	Draw Desc	Image
------	-------	----------	-------	--------	----------------	------	-----------	--------	------	-----------	-------

☐ 2. Document ID: US 5617861 A Relevance Rank: 59

L2: Entry 3 of 3

File: USPT

Apr 8, 1997

US-PAT-NO: 5617861

DOCUMENT-IDENTIFIER: US 5617861 A

TITLE: Magnetic resonance spectral analysis of the brain for diagnosis of clinical conditions

DATE-ISSUED: April 8, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ross; Brian	Altadena	CA		
Ernst; Thomas	Gundelfingen			DEX
Kreis; Roland	Boll			CHX

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
Huntington Medical Research Institutes	Pasadena	CA			02	

APPL-NO: 8/ 197099

DATE FILED: February 16, 1994

INT-CL: [6] A61B 5/055

US-CL-ISSUED: 128/653.2

US-CL-CURRENT: 600/410

FIELD-OF-SEARCH: 128/653.2, 128/632, 324/307, 436/173

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>5109868</u>	May 1992	Smith et al.	128/774
<u>5111819</u>	May 1992	Hurd	128/653.2
<u>5182299</u>	January 1993	Gullans et al.	514/460
<u>5200345</u>	April 1993	Young	128/653.2
<u>5218529</u>	June 1993	Meyer et al.	364/413.01
<u>5283526</u>	February 1994	Spielman et al.	128/653.2
<u>5357959</u>	October 1994	Fishman	128/653.2

OTHER PUBLICATIONS

T. Ernst, et al., "Absolute Quantitation of Water and Metabolites in the Human Brain; I. Compartments and Water" Journal of Magnetic Resonance, Series B 102, 1-8 (1993).

R. Kreis, et al., "Absolute Quantitation of Water and Metabolites in the Human Brain. II. Metabolite Concentrations" Journal of Magnetic Resonance, Series B 102, 9-19 (1993).

Bruce L. Miller, et al., "Alzheimer Disease: Depiction of Increased Cerebral Myo-Inositol with Proton MR Spectroscopy"; Radiology 1993; 187:433-437.

Roland Kreis, et al., "Development of the Human Brain: In Vivo Quantification of Metabolite and Water Content with Proton Magnetic Resonance Spectroscopy"; Magnetic Resonance in Medicine 30: 424-437 (Aug. 1993).

Brian Ross, et al., ".sup.1 H MRS for the Diagnosis of Sub-Clinical Hepatic Encephalopathy (SCHE)"; Proceedings, 12th Society of Magnetic Resonance in Medicine, New York; vol. 1, 1993 p. 131.

Rex A. Moats, et al., "Cancer Markers Identified with 2-D COSY NMR on Fresh Human Prostate Samples"; Proceedings, 12th Society of Magnetic Resonance in Medicine, New York; vol. 2 (Aug. 1993) p. 1030.

Keiko Kanamori, et al., "A .sup.15 N NMR Study of In Vivo Cerebral Glutamine

Synthesis in Hyperammonemic Rats"; NMR in Biomedicine, vol. 6, 21-26 (Jan., 1993).

Brian D. Ross, "Biochemical Considerations in ¹H Spectroscopy. Glutamate and Glutamine; Myo-inositol and Related Metabolites"; NMR in Biomedicine, vol. 4, 59-63 (1991).

Thomas Ernst, et al., "Cerebral MRS in infant with suspected Reye's syndrome"; The Lancet, vol. 340:486 (Aug. 22, 1992).

Roland Kreis, et al., "Metabolic Disorders of the Brain in Chronic Hepatic Encephalopathy Detected with H-1 MR Spectroscopy"; Radiology, vol. 182, No. 1, Jan. 1992, pp. 19-27.

Roland Kreis, et al., "Cerebral Metabolic Disturbances in Patients with Subacute and Chronic Diabetes Mellitus: Detection with Proton MR Spectroscopy"; Radiology, 1992; 184: 123-130.

C.D. Smith, et al., "³¹P Magnetic Resonance Spectroscopy in Alzheimer's and Pick's Disease"; Neurobiology of Aging, vol. 14, No. 1, pp. 85-92, 1993.

Gregory G. Brown, PhD., et al., "Altered Brain Energy Metabolism in Demented Patients With Multiple Subcortical Ischemic Lesions: Working Hypothesis"; Archives of Neurology, vol. 50, No. 4, pp. 384-388 (Apr. 1993).

Jay W. Pettegrew, M.D., et al., "Correlation of Phosphorus-31 Magnetic Resonance Spectroscopy and Morphologic Findings in Alzheimer's Disease"; Archives of Neurology, vol. 45, No. 10, pp. 1093-1096 (Oct. 1988).

R. K. Gupta, et al., "Magnetic Resonance Imaging and Localized In Vivo Proton Spectroscopy in Patients with Fulminant Hepatic Failure"; The American Journal of Gastroenterology, vol. 88 No. 5, pp. 670-674 (1993).

Peter L. Hope, et al., "Magnetic Resonance Spectroscopy"; vol. 18 No. 3, pp. 535-548 (1991).

Jan M. Goplerud, M.D., et al., "Nuclear Magnetic Resonance Imaging and Spectroscopy Following Asphyxia"; Clinics in Perinatology, vol. 20, No. 2, pp. 345-367 (1993).

David K. Menon, et al., "Proton MR Spectroscopy of the Brain in AIDS Dementia Complex"; Journal of Computer Assisted Tomography, vol. 16, No. 4, pp. 538-542 (1992).

Akihiko Shiino, M.D., et al., "Proton Magnetic Resonance Spectroscopy with Dementia"; Surgical Neurology, col. 39, No. 2, pp. 143-147 (1993).

James E. Bradler, et al., "Actions of Phosphomonoesters on CA1 Hippocampal Neurons as Revealed by a Combined Electrophysiological and Nuclear Magnetic Resonance Study"; Synapse, vol. 9, No. 1, pp. 7-13 (1991).

James Peeling, Ph.D., et al., "¹H Magnetic resonance spectroscopy of extracts of human epileptic neocortex and hippocampus"; Neurology Contents, 1993; 43: 589-594.

Dominique Sappey-Marinier, et al., "Proton Magnetic Resonance Spectroscopy of Human Brain: Applications to Normal White Matter, Chronic Infarction, and MRI White Matter Signal Hyperintensities"; Magnetic Resonance in Medicine, vol. 26, No. 2, pp. 313-327 (Aug. 1992).

Michael J. Fulham, et al., "Mapping of Brain Tumor Metabolites with Proton MR Spectroscopic Imaging: Clinical Relevance"; Radiology, vol. 183, No. 3, pp. 675-686 (Dec. 1992).

Dominique Sappey-Marinier, et al., "Alterations in Brain Phosphorus Metabolite Concentrations Associated with Areas of High Signal Intensity in White Matter at MR Imaging"; Radiology, vol. 183, No. 1, pp. 247-256 (1992).

Harald Kugel, Ph.D., et al., "Human Brain tumors: Spectral Patterns Detected with Localized H-1 MR Spectroscopy"; Radiology, vol. 183, No. 3, pp. 701-709 (1992).

Magnetic Resonance in Medicine, A Report on a Workshop Held in Oxford, England, Dec. 16-18, 1992, "Advances in Proton Magnetic Resonance Spectroscopy of the Brain"; pp. 1-3.

Tetsuhito Murata, et al., "In vivo Proton Magnetic Resonance Spectroscopy Study on Premature Aging in Adult Down's Syndrome"; Biological Psychiatry, vol. 34, No. 5, pp. 290-297 (1993).

G. D. Graham, et al., "Proton magnetic resonance spectroscopy in Creutzfeldt-Jakob disease"; Neurology, vol. 43, No. 10, pp. 2065-2068 (1993).

Book Review by Oleg Jardetzky, "In Vivo Magnetic Resonance Spectroscopy I, II & III"; TAMU NMR Newsletter, 423: 37-38, 41 (19).

Brian D. Ross, M.D., PhD., et al., "Well-localized, Standardized, Quantitized Short TE ¹H MRS Permits New Diagnostic Accuracy in Patients with Alzheimer Disease"; TAMU NMR Newsletter, Feb. 17, 1993, 423-13.

J. Hennig, et al., "Determination of Absolute Concentration of Metabolites by Localized in vivo-Proton Spectroscopy," Abstracts of the Society of Magnetic Resonance in Medicine, 10th Annual Meeting, Works in Progress, p. 1013 (1991).

Wehrli, PhD., et al., "Quantification of Contrast in Clinical MR Brain Imaging at

High Magnetic Field," Investigative Radiology, vol. 20, No. 4, pp. 360-369 (1985).

R.S. Menon, et al., "Application of Continuous Relaxation Time Distributions to the Fitting of Data from Model Systems and Excised Tissue," Magnetic Resonance in Medicine 20, 214-227 (1991).

Peter B. Barker, et al., ".sup.1 H NMR Spectroscopy of Canavan's Disease," Abstract of the Society of Magnetic Resonance in Medicine, 10th Annual Meeting, vol. 1, p. 381 (1991).

Michaelis, et al., "Quantification of Cerebral Metabolites in Man; Results Using Short-Echo Time Localized Proton MRS," Abstract of the Society of Magnetic Resonance in Medicine, 10th Annual Meeting, vol. 1, p. 387 (1991).

Harris H. Tallan, "Studies On The Distribution of N-Acetyl-Aspartic Acid in Brain," J. Biol. Chem., 224 41-43 (1957).

Ogden A.C. Petroff, M.D., et al., "High-field proton magnetic resonance spectroscopy of human cerebrum obtained during surgery for epilepsy," Neurology, 39, 1187-1202 (1989).

R. Burri, et al., "Brain Development: .sup.1 H Magnetic Resonance Spectroscopy of Ray Brain Extracts Compared With Chromatographic Methods," Neurochem. Res., 15 1009-1016 (1990).

Richard L. Veech, et al., "Cytosolic Phosphorylation Potential," J. Biol. Chem., 254 6538-6547 (1979).

Bruce L. Miller, "A Review of Chemical Issues in .sup.1 H NMR Spectroscopy: N-Acetyl-L-aspartate, Creatine and Choline," NMR Biomed., vol. 4, pp. 47-52 (1991).

W.W. Wells, et al., "The Isolation and Identification of Galactitol from the Brains of Galactosemia Patients," J. Biol. Chem., vol. 240, pp. 1002-1004 (1965).

J. Hennig, et al. "Direct Absolute Quantification of Metabolites in the Human Brain with In Vivo Localized Proton Spectroscopy", NMR In Biomedicine, vol. 5, 193-199 (1992).

Peter B. Barker, et al., "Quantitation of Proton NMR Spectra of the Human Brain Using Tissue Water as an Internal Concentration Reference", NMR in Biomedicine, vol. 6, 89-94 (1993).

Thomas Michaelis, PhD., et al., "Absolute Concentrations of Metabolites in the Adult Human Brain in Vivo: Quantification of Localized Proton MR Spectra.sup.1 ", Neuroradiology, RSNA, pp. 219-227 (Apr. 1993).

ART-UNIT: 335

PRIMARY-EXAMINER: Smith; Ruth S.

ATTY-AGENT-FIRM: Christie, Parker & Hale, LLP

ABSTRACT:

The present invention relates to a method for determining the concentration of metabolites in the brain using magnetic resonance spectrum techniques. The method comprising defining a volume within the brain, obtaining a magnetic resonance spectrum of the defined volume, suppressing the signal from water to reveal the spectra from metabolites, correcting the baseline, obtaining the magnetic resonance spectrum of an external standard, comparing the signal from the metabolites to the signal from the external standard and calculating the in vivo concentration of the metabolites. In one embodiment of the invention a diagnosis for Alzheimer Disease is made by comparing the relative peak heights of myo-inositol relative to creatine and N-acetylaspartate relative to creatine in the patient to the relative peak heights of myo-inositol relative to creatine and N-acetylaspartate relative to creatine for a normal population, wherein an increase in the relative peak height of myo-inositol and a decrease in the relative peak height of N-acetylaspartate is diagnostic of Alzheimer Disease.

15 Claims, 27 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

☐ 3. Document ID: US 5994902 A Relevance Rank: 54

US-PAT-NO: 5994902
DOCUMENT-IDENTIFIER: US 5994902 A

TITLE: Chemical shift imaging with spectrum modeling

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Xiang; Qing-San	Vancouver			CAX
An; Li	Stafford	TX		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE	CODE
The University of British Columbia	Vancouver			CAX		03

APPL-NO: 9/ 058317
DATE FILED: April 9, 1998

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATION This application claims the benefit of U.S. provisional application Ser. No. 60/042,538, filed Apr. 10, 1997.

INT-CL: [6] G01V 3/00

US-CL-ISSUED: 324/307; 324/309, 324/314, 600/414, 436/173

US-CL-CURRENT: 324/307; 324/309, 324/314, 436/173, 600/414

FIELD-OF-SEARCH: 324/307, 324/309, 324/310, 324/311, 324/312, 324/314, 600/414, 436/173

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<u>4797615</u>	January 1989	Rotem et al.	324/307
<u>5321359</u>	June 1994	Schneider	324/307

OTHER PUBLICATIONS

Xiang, Q.-S., et al., "General 3-Point Water-Fat Imaging with Optimized SNR," Proceedings of the Fourth Annual Scientific Meeting of the International Society for Magnetic Resonance in Medicine, New York, NY, Apr. 27-May 23, 1996.

Brown, T.R., et al., "NMR chemical shift imaging in three dimensions," Proc. Natl. Acad. Sci. USA, vol. 79, Jun. 1982, pp. 3523-3526.

Maudsley, A.A., et al., "Spatially Resolved High Resolution Spectroscopy by `Four-Dimensional` NMR," Journal of Magnetic Resonance, Communications, vol. 51, 1983, pp. 147-152.

Dixon, W.T., "Simple Proton Spectroscopic Imaging," Radiology, vol. 153, Oct. 1984, pp. 189-194.

Glover, G.H., et al., "Three-Point Dixon Technique for True Water/Fat Decomposition with B.sub.0 Inhomogeneity Correction," Magnetic Resonance in Medicine, vol. 18, 1991, pp. 371-383.

Szumowski, J., et al., "Phase Unwrapping in the Three-Point Dixon Method for Fat Suppression MR Imaging," Radiology, Aug. 1994, vol. 192, pp. 555-561.

ART-UNIT: 287

PRIMARY-EXAMINER: Oda; Christine

ASSISTANT-EXAMINER: Shrivastav; Bry B.

ATTY-AGENT-FIRM: Christensen O'Connor Johnson & Kindness PLLC

ABSTRACT:

Chemical shift imaging with spectrum modeling (CSISM) models the general chemical shift spectrum as a system with N distinct peaks with known resonant frequencies and unknown amplitudes. Based on the N peak spectrum model, a set of nonlinear complex equations is set up that contains N+1 unknowns of two kinds: the magnitudes of the N peaks, and a phasor map caused by main magnetic field inhomogeneity. Using these equations, the timing parameters for shifting the 180.degree. RF refocusing pulses for acquiring spin-echo images are optimally chosen. Corresponding timing parameters for other pulse sequences can also be optimized similarly. Using the chosen timing parameters, a plurality of images are acquired. Next, acquired image data are automatically processed to solve the complex linear equations. First, the phasor map is found by fitting various phasor map values over a small number of pixels, or "seeds", that are picked sparsely in a field of view. Second, from the original "seeds", the region of pixels that are picked to find the best-fit phasor map is grown into the entire field of view, based on a predetermined phase difference between the original seed and a neighboring pixel. The optimal phasor map value is then entered into the complex linear equations to derive the only unknown values at this point--the peak amplitudes. Optionally, second pass solutions of the peak amplitudes may be obtained using a smoothed phasor map value. When the equations are solved, the spectroscopic images are output.

10 Claims, 2 Drawing figures

Full	Title	Citation	Front	Review	Classification	Date	Reference
------	-------	----------	-------	--------	----------------	------	-----------

KWIC	Draw Desc	Image
------	-----------	-------

Generate Collection

Term	Documents
MAGNETIC.USPT.	327513
MAGNETICS.USPT.	7243
RESONANCE.USPT.	79299
RESONANCES.USPT.	8603
FAST-SPIN.USPT.	4
FAST-SPINS	0
ECHO.USPT.	18738
ECHOES.USPT.	8153
ECHOS.USPT.	1539
ECHOE.USPT.	22
((FAST-SPIN ADJ ECHO) AND (MAGNETIC ADJ RESONANCE)).USPT.	3

Display

35

Documents, starting with Document:

3

Display Format: FRO

Change Format